

IN THE CLAIMS

Claims 1-52 (cancelled)

Claim 53 (originally filed): A method for cleaning air, comprising the steps of:

contacting air with the surface of a composite material which is exposed to light; and
contacting the surface of the composite material with water, said composite material comprising at least a substrate and a surface layer, said surface layer being hydrophilic and self-cleanable, said surface layer comprising:

a component (i) comprising a photocatalyst which functions as a catalyst upon exposure to light;

a component (ii) comprising at least one metal oxide selected from the group consisting of Al_2O_3 , ZnO , SrO , BaO , MgO , CaO , Rb_2O , Na_2O , K_2O , and P_2O_5 ; and

a component (iii) comprising at least one metal oxide selected from the group consisting of SiO_2 , ZrO_2 , GeO_2 , and ThO_2 .

Claim 54 (originally filed): A method according to claim 53, wherein the composite material satisfies $a/(a+b)$ of about 0.0001 to about 0.8, wherein a represents the weight of the metal oxide as the component (ii) and b represents the weight of the photocatalyst as the component (i).

Claim 55 (originally filed): A method according to claim 53, wherein the photocatalyst as the component (i) and the metal oxide as the component (ii) are contained in the form of particles having a diameter of about 0.005 to about 0.5 microns.

Claim 56 (originally filed): A method according to claim 53, wherein the composite material further comprises a component (iv) comprising at least one antimicrobial metal selected from the group consisting of zinc, silver, and copper, the antimicrobial metal as the component (iv) is supported on the photocatalyst as the component (i).

Claim 57 (originally filed): A method according to claim 53, wherein at least one metal selected from the group consisting of silver, copper, palladium, iron, nickel, chromium, cobalt, platinum, gold, rhodium, and ruthenium is contained as the component (iv) in an amount effective for improving the oxidative degradation activity.

Claim 58 (originally filed): A method according to claim 53, wherein at least one metal selected from the group consisting of lithium, calcium, magnesium, and aluminum is contained as the component (iv) in an amount effective for improving the hydrophilicity.

Claim 59 (originally filed): A method according to claim 56, wherein the composite material satisfies c/d of about 0.00001 to about 0.05 wherein c represents the weight of the component (iv) and d represents the weight of the photocatalyst as the component (i).

Claim 60 (originally filed): A method according to claim 53, wherein the surface layer has a geometry satisfying any one of the following requirements (1) and (2):

(1) thickness of the surface layer is about 0.01 to about 3.0 microns; and

(2) difference in color ΔE of the surface layer between before ultraviolet irradiation and after ultraviolet irradiation of the surface layer, with a 1% silver nitrate solution deposited thereon, for 5 min at an ultraviolet intensity on the surface layer of 1.2 mW/cm^2 , is 1 to 50.

Claim 61 (originally filed): A method according to claim 53, wherein the composite material has a binder which is interposed between the substrate and the surface layer.

Claim 62 (originally filed): A method according to claim 61, wherein the binder is polymerizable or meltable below a temperature at which the substrate is deformed, to fix the surface layer onto the substrate.

Claim 63 (originally filed): A method according to claim 62, wherein the binder is a glaze or a paint.

Claim 64 (originally filed): A method according to claim 53, wherein the substrate is a tile.

Claim 65 (originally filed): A method according to claim 53, wherein the substrate is an earthenware, a wood, a calcium silicate material, concrete, a cement board, a cement extruded board, a plaster board, or an autoclave light-weight concrete board.

Claim 66 (originally filed): A method according to claim 53, wherein the composite material has an antimicrobial metal or a metal compound which is anchored on the surface of the surface layer.